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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,359	08/19/2003	Ning An	50277-1068	4851

23517 7590 12/27/2006

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EXAMINER	
CAO, PHUONG THAO	
ART UNIT	**PAPER NUMBER**
2164	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/27/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/643,359	AN ET AL.	
	Examiner	Art Unit	
	Phuong-Thao Cao	2164	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,6-12,14,15 and 18-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,6-12,14,15 and 18-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to Amendment filed on 11/2/2006.

2. Claims 1, 4, 6, 14 and 18-20 have been amended. Currently, claims 1, 3-4, 6-12, 14-15 and 18-20 are pending.

Response to Arguments

3. Applicant's arguments with respect to claims 1, 3-4, 6-12, 14-15 and 18-20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

4. Claims 3-4, 7-12 and 15 are improper dependent claims. The "A method" at the beginning of each claim should be replaced by "The method".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 3-4, 6-12, 14-15 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kothuri et al. (US Patent No 6,381,605) in view of Chen et al. ("Merging R-Trees: Efficient Strategies for Local Bulk Insertion", GeoInformatica: March 2002).

As to claim 1, Kothuri et al. teach:

"A method of inserting a plurality of entries into an existing index keyed by multidimensional data" (see Abstract and [column 14, lines 55-65]) comprising:

"selecting subsets of the index that overlap if the entries are inserted into the subsets of the index" (see [column 15, lines 55-60] wherein branch or subtree is equivalent to Applicant's "subsets of index");

"inserting the entries within the subsets of the index" (see [column 15, lines 55-65] for the disclosure of inserting data item into leaf nodes of the selected subtrees, wherein "data item" is equivalent to Applicant's "entries" and "leaf nodes of the selected subtree" is equivalent to Applicant's "within the subsets of the index");

"reorganizing the subsets of the index with the inserted entries, wherein said reorganizing includes reorganizing such that an amount of overlap of bounding boxes for objects in a strict subset of the index is reduced" (see [column 15, lines 60-67] and [column 16, lines 1-10] wherein the process of splitting node is equivalent to reorganizing the subsets of the index with the inserted entries as illustrated in Applicant's claim language).

Kothuri et al. does not teach the selecting "wherein the subsets of the index are sibling nodes of one another and not leaf nodes."

Chen et al. teach the selecting "wherein the subsets of the index are sibling nodes of one another and not leaf nodes" (see [page 14, paragraph 1-2] for the IndexNode and its siblings which are not leaf nodes).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Kothuri et al. by the teaching of Chen et al. to add the feature of selecting subsets of index wherein the subsets of the index are sibling nodes of one another and not leaf nodes since this feature provides an effective and flexible way to select subsets in the index.

As to claim 3, this claim is rejected based on arguments given above for rejected claim 1 and is similarly rejected including the following:

Kothuri et al. as modified teach:

"the entries include spatial data" (see [column 5, lines 40-42]); and

"the index keyed by multidimensional data includes a spatial index" (see [column 6, lines 30-40] and [column 7, lines 1-30] wherein R-tree index is a spatial index).

As to claim 4, this claim is rejected based on arguments given above for rejected claim 1 and is similarly rejected including the following:

Kothuri et al. as modified teach:

"wherein sibling nodes are for an R-tree index" (see Fig. 4 wherein node 412 and node 414 are sibling nodes for R-tree index 400).

As to claim 6, Kothuri et al. teach:

"A method of inserting a plurality of entries into an existing spatial index" (see [column 15, lines 37-50]), comprising:

"selecting at least two and less than all children of a node in the spatial index, wherein the selected children include objects distributed within" (see [column 15, lines 55-67] wherein children leaf nodes whose MBAs overlap of the node at the root of a selected subtree are equivalent to Applicant's "selecting at least two and less than all children of a node");

"distributing the entries within the selected children" (see [column 15, lines 37-40 and 60-65] and [column 16, lines 1-10]); and

"reorganizing the objects distributed within the selected children" (see [column 15, lines 35-40] and [column 16, lines 1-10] wherein the process of splitting node and dividing the entries as disclosed is equivalent to Applicant's "reorganizing" and entries are equivalent to Applicant's "objects").

Kothuri et al. does not teach "wherein the selected children are not leaf nodes."

Chen et al. teach the selecting "wherein the selected children are not leaf node" (see [page 14, paragraph 1-2] for the IndexNode and its siblings which are not leaf nodes).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Kothuri et al. by the teaching of Chen et al. to add the feature of selecting children of an node wherein the selected children are not leaf nodes since this feature provides an effective and flexible way to select nodes or subsets in the index.

As to claim 7, this claim is rejected based on arguments given above for rejected claim 6 and is similarly rejected including the following:

Kothuri et al. as modified teach:

"wherein said reorganizing includes reorganizing such that an amount of overlap of bounding boxes for objects in the spatial index is reduced" (see [column 16, lines 1-10] wherein the process of splitting node and dividing the entries or data items as disclosed is equivalent to Applicant's "reorganizing" and overlap between the nodes' MBAs is equivalent to Applicant's "overlap of bounding boxes for objects").

As to claim 8, this claim is rejected based on arguments given above for rejected claim 7 and is similarly rejected including the following:

Kothuri et al. as modified teach:

"wherein one of the bounding boxes includes a minimum bounding rectangle (MBR) (see Fig 7A and [column 7, lines 1-5] wherein MBA is equivalent to Applicant's "MBR").

As to claim 9, this claim is rejected based on arguments given above for rejected claim 6 and is similarly rejected including the following:

Kothuri et al. as modified teach:

"wherein at least two of the selected children have respective bounding boxes that overlap with one another" (see [column 15, lines 58-62] wherein children leaf nodes (belonging to the selected subtree) whose MBAs overlap is equivalent to Applicant's claim language).

As to claim 10, this claim is rejected based on arguments given above for rejected claim 6 and is similarly rejected including the following:

Kothuri et al. as modified teach:

"wherein said selecting includes selecting exactly two of the children" (see [column 16, lines 1-10] where node is split into two nodes which is equivalent to Applicant's "two of the children" and these two nodes are selected for dividing the entries).

As to claim 11, this claim is rejected based on arguments given above for rejected claim 10 and is similarly rejected including the following:

Kothuri et al. as modified teach:

"wherein the exactly two of the children having respective bounding boxes that overlap with one another" (see [column 16, lines 1-10] wherein two nodes of the splitting equivalent to Applicant's "two of the children").

As to claim 12, this claim is rejected based on arguments given above for rejected claim 6 and is similarly rejected including the following:

Kothuri et al. as modified teach:

"Wherein the objects distributed among the selected children include entries" (see Abstract and [column 16, lines 1-10]).

As to claim 14, Kothuri et al. teach:

"A method of inserting a plurality of entries into an existing multidimensional keyed index organized as an R-Tree" (see [column 14, lines 33-45]), comprising:

"associating a node in the R-tree with a buddy node that is a sibling of the node" (see [column 14, lines 50-52] wherein clustering the data items implies associating a node in the R-tree with a buddy node as illustrated in Applicant's claim language);

"clustering children of the node and the children of the buddy" (see [column 14, lines 45-55] wherein clustering data items is equivalent to Applicant's "clustering children of the node and children of the buddy");

"partitioning the clustered children and the entries into a plurality of groups, wherein a least one of the groups includes a child node of the cluster node, a buddy child node associated with child node, and one or more of the entries, said partition is performed so that overlap among bounding boxes associated with the groups is reduced" (see [column 15, lines 8-40] and [column 16, lines 1-10]); and

"inserting said one or more of the entries among the child node and the buddy child node associated the child node" (see [column 16, lines 1-15] wherein the old leaf node is equivalent to Applicant's "child node" and new leaf node is equivalent to Applicant's "buddy child node associated with child node").

Kothuri et al. does not teach the associating "wherein the node and the buddy node are not leaf nodes."

Chen et al. teach the associating "wherein the node and the buddy node are not leaf nodes" (see [page 14, paragraph 1-2] for the IndexNode and its siblings which are not leaf nodes).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Kothuri et al. by the teaching of Chen et al. to add the feature of associating wherein the node and the buddy node are not leaf nodes since this feature provides an effective and flexible way to associate nodes in the index.

As to claim 15, this claim is rejected based on arguments given above for rejected claim 14 and is similarly rejected including the following:

Kothuri et al. as modified teach:

"each node of the R-tree is associated with a respective bounding box" (see [column 7, lines 1-10]); and

"a first bounding box associated with the child node overlaps a second bounding box associated with the buddy child node" (see Fig 1 wherein bounding box B1 associated with node 161 overlaps bounding box B2 associated with the buddy child node 162, as illustrated in Applicant's claim language).

As to claim 18, Kothuri et al. teach:

"A tangible computer-readable medium bearing instruction for inserting a plurality of entries into an existing index keyed by multidimensional data" (see Abstract and [column 14, lines 55-65]) said instructions arranged, upon execution by at least one processor, to perform the steps of:

"selecting subsets of the index that overlap if the entries are inserted into the subsets of the index" (see [column 15, lines 55-60] wherein branch or subtree is equivalent to Applicant's "subsets of index");

"inserting the entries within the subsets of the index" (see [column 15, lines] for the disclosure of inserting data item into leaf nodes of the selected subtrees, wherein "data item" is equivalent to Applicant's "entries" and "leaf nodes of the selected subtree" is equivalent to Applicant's "within the subsets of the index");

"reorganizing the subsets of the index with the inserted entries, wherein said reorganizing includes reorganizing such that an amount of overlap of bounding boxes for objects in a strict subset of the index is reduced" (see [column 15, lines 60-67] and [column 16, lines 1-10] wherein the process of splitting node is equivalent to reorganizing the subsets of the index with the inserted entries as illustrated in Applicant's claim language).

Kothuri et al. does not teach the selecting "wherein the subsets of the index are sibling nodes of one another and not leaf nodes."

Chen et al. teach the selecting "wherein the subsets of the index are sibling nodes of one another and not leaf nodes" (see [page 14, paragraph 1-2] for the IndexNode and its siblings which are not leaf nodes).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Kothuri et al. by the teaching of Chen et al. to add the feature of selecting subsets of index wherein the subsets of the index are sibling nodes of one another and not leaf nodes since this feature provides an effective and flexible way to select subsets in the index.

As to claim 19, Kothuri et al. teach:

"A tangible computer-readable medium bearing instructions for inserting a plurality of entries into an existing spatial index"(see [column 15, lines 37-50]), said instruction arranged, upon execution by at least one processor, to perform the steps of:

"selecting at least two and less than all children of a node in the spatial index, wherein the selected children include objects distributed within" (see [column 15, lines 55-67] wherein children leaf nodes whose MBAs overlap of the node at the root of a selected subtree are equivalent to Applicant's "selecting at least two and less than all children of a node");

"distributing the entries within the selected children" (see [column 15, lines 37-40 and 60-65] and [column 16, lines 1-10]); and

"reorganizing the objects distributed within the selected children, wherein said reorganizing includes reorganizing such that an amount of overlap of bounding boxes for objects in a strict subset of the index is reduced" (see [column 15, lines 60-67] and [column 16, lines 1-10] wherein the process of splitting node is equivalent to reorganizing as illustrated in Applicant's claim language).

Kothuri et al. does not teach "wherein the selected children are not leaf nodes."

Chen et al. teach the selecting "wherein the selected children are not leaf node" (see [page 14, paragraph 1-2] for the IndexNode and its siblings which are not leaf nodes).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Kothuri et al. by the teaching of Chen et al. to add the feature of selecting children of an node wherein the selected children are not leaf nodes since this feature provides an effective and flexible way to select nodes or subsets in the index.

As to claim 20, Kothuri et al. teach:

"A tangible computer-readable medium bearing instructions for inserting a plurality of entries into an existing multidimensional keyed index organized as an R-Tree" (see [column 14, lines 33-45]), said instructions arranged, upon execution by at least one processor, to perform the steps of:

"associating a node in the R-tree with a buddy node that is a sibling of the node" (see [column 14, lines 50-52] wherein clustering the data items implies associating a node in the R-tree with a buddy node as illustrated in Applicant's claim language);

"clustering children of the node and the children of the buddy" (see [column 14, lines 45-55] wherein clustering data items is equivalent to Applicant's "clustering children of the node and children of the buddy");

"partitioning the clustered children and the entries into a plurality of groups, wherein a least one of the groups includes a child node of the cluster node, a buddy child node associated with child node, and one or more of the entries, said partition is performed so that overlap among bounding boxes associated with the groups is reduced" (see Fig. 3, [column 15, lines 8-40] and [column 16, lines 1-10]); and

"inserting said one or more of the entries among the child node and the buddy child node associated the child node" (see [column 16, lines 1-15] wherein the old leaf node is equivalent to Applicant's "child node" and new leaf node is equivalent to Applicant's "buddy child node associated with child node").

Kothuri et al. does not teach the associating "wherein the node and the buddy node are not leaf nodes."

Chen et al. teach the associating "wherein the node and the buddy node are not leaf nodes" (see [page 14, paragraph 1-2] for the IndexNode and its siblings which are not leaf nodes).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Kothuri et al. by the teaching of Chen et al. to add the feature of associating wherein the node and the buddy node are not leaf nodes since this feature provides an effective and flexible way to associate nodes in the index.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong-Thao Cao whose telephone number is (571) 272-2735. The examiner can normally be reached on 8:30 AM - 5:00 PM (Mon - Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Rones can be reached on (571) 272-4085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PTC

December 18, 2006

CHARLES RONES
SUPERVISORY PATENT EXAMINER

20 December 2006